A Dissertation on

A Comparative study of Scrape cytology and biopsy in Mucocutaneous malignancies

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BONAFIDE CERTIFICATE

This is to certify that **Dr. G. GOPU,** bonafide student of M.Ch. Surgical Oncology. (July 2006 to August 2009) in the Department of Surgical Oncology, Government Royapettah Hospital, Chennai – 600 014, has done this dissertation on

"**A Comparative study of Scrape cytology and biopsy in Mucocutaneous malignancies**" under my guidance and supervision in the partial fulfilment of the regulations laid down by The Tamil Nadu Dr. M. G. R. Medical University, Chennai for M.Ch. Surgical Oncology Examination to be held in August 2009.

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INTRODUCTION

Exfoliative cytology is the microscopic examination of shed or desquamated cells from the epithelial surface usually the mucous membrane. It also includes the study of those cells that have been collected by scraping the tissue surface or collected from body fluids such as sputum.

The understanding and application of exfoliative cytology techniques in mucocutaneous malignancies in India is not widely used particularly, for the purpose of diagnosis unlike our counter parts in the developed countries. More papers on exfoliative cytology were published during the period 1955-75 than in any other period. Renewed interest emerged in the past decade after the employment of newer techniques of quantitative analysis, DNA cytomorphometry, and identification of tumour markers on the cytological samples.

The Rationale of exfoliative cytology lies in the epithelial physiology. Continuous exfoliation of epithelial cells is a part of physiological turnover. Deeper cells, which are strongly adhered in normal conditions, become loose in the case of malignancy and exfoliate along with superficial cells.

The available literature suggests that Walsh was the first person to have described cancer cells in a patient's sputum as early as in 1843.
Lebert in 1851 emphasized the altered size of cells and nuclei as a basis of diagnosing cancer. Bealem 1960 attempted a cytological diagnosis of oropharyngeal cancer. Dudgeon in1927 devised a direct smear technique of surgical specimen for rapid diagnosis.

In the year l941 George N Papanicolaou started using what is today called as "PAP test" as a routine procedure for early detection of cervical cancer. Ziskin was the first person to have reported the use of exfoliative cytology in oral cavity. Montgomery and Von Hamm in1951 used exfoliative cytology for the diagnosis of oral cancer.
John K Frost opines that general biological activity is reflected best in nucleus and functional activity is reflected in cytoplasm. .
The basic biological feature of a cell whether be it a proplastic (Cell with an increased activity) or a retroplastic (a degenerating cell) is defined by the chromatin-para chromatin interface. Here the chromatin refers to the condensed, functionally inactive heterochromatin seen in the periphery of a nucleus and parachromatin refers to the distended functionally active chromatin.

The junction is crisp and sharply defined in proplasia as euchromatin is highly active thereby pushing the heterochromatin to the periphery. In retroplasia the junction is blurred and indistinct. Proplasia and retroplasia can be together considered as euplasia or, the normal cell growth. In contrast to a euplastic cell, the morphology of a neoplastic cell is not well defined and exhibits protean feature.

Scrape cytology forms a reliable outpatient procedure for screening as well as for diagnosing mucocutaneous cancer. Moreover scrape cytology can be repeated and the patient compliance is excellent.

Scrape can be done in outpatient settings for rapid diagnosis as against biopsy. The duration of the scrape cytology process takes 20 min as against 3 to 4 days for biopsy.

Positive results can be taken reliably for making a clinical decision but for negative result needs a biopsy for reconfirmation. The sensitivity and specificity of the scrape cytology is approaching 100% by applying recent advances in various studies.

In the present study we compared the scrape cytology against the gold standard biopsy procedu

re and its reliability in making a clinical decision.

AIM OF STUDY

Scrape (exfoliative) cytology is a simple and non invasive procedure, which has been a controversial technique according to its real validity. In recent times it has re-emerged due to its application in mucocutaneous cancer as a diagnostic and predictive method as well as for monitoring patients. New diagnostic techniques have been developed, such as “brush biopsy” and multiple molecular studies using the cells collected.

The aim of the present study is to compare the usefulness of scrape cytology and biopsy in the diagnosis of accessible mucocutaneous malignancies done at Surgical Oncology department of Government Royapettah hospital and there by determining its sensitivity, specificity, positive and negative predictive value.

REVIEW OF LITERATURE:

CYTOPATHOLOGY

Pioneers of cytologic methods made observation that holds true today: the power of cytopathology lies in its simplicity. Diagnoses can be made by the study of spontaneously exfoliated cells as obtained from the uterine cervix, lung or urinary tract, cells that are mechanically dislodged by scraping, washing, or brushing.

In the western world, microscopic examination of tissues had become established as the standard for cancer diagnosis.

Cytopathology has moved to centre stage in contemporary anatomic pathology. Here it occupies two distinctly different roles, serving either as a screening test, and it has had unparalleled success in the detection of cellular abnormalities of the cervix before they progressed to invasive carcinoma.

Since the late 1940's ,the incidence and mortality for invasive carcinoma of the cervix have declined 70%-75% in the U.S. the widespread use of the Papanicolaou smear is generally cited has the major factor influencing these trends. A philosophy held by most cytopathologist is that a cytopathologic diagnosis should carry the same level accuracy as a histopathologic diagnosis. With these view, because surgery or chemo theraphy may result from the cytopathologic diagnosis, it is paramount that the pathologist understand the morphologic criteria that distinguish benign from malignant conditions.

Exfoliative cytology has been used as a diagnostic test for precancerous and cancerous lesions presenting in the oral cavity' However, in general, cytology has relied primarily on the personal judgement of the cytologist. The major value of cytology is the non-invasive nature of a simple and relatively pain free procedure, which can provide intact cells from different layers within the epithelium.

Cytology has been recommended for the early diagnosis of oral cancer and proved to be a reliable primary diagnostic test. The aims of this study were

to apply the quantitative techniques, outlined by Cowpe et al, to smears collected from suspicious lesions presenting in the oral cavity.

Thus attempting to improve the diagnostic sensitivity of cytology in the detection of early oral malignancy, above and beyond subjective interpretation.

PRINCIPLES OF CYTOMORPHOLOGY

For the purposes of diagnostic cytopathology, cells can be categorized morphologically in to 5 groups: normal, reactive, degenerate, dysplastic, and neoplastic.

The Assessment of the individual cells is based several parameters, such as cell size, cell shape, the ratio of nuclear area to cytoplasmic area, cytoplasmic qualities, such as staining or the presence or absence of mucin, nuclear qualities including the size, shape and distribution of chromatin and the number, size, shape of the nucleoli. The statements that follow refer to cells stained by the Papanicolaou method, which is preferred by most

American pathologist, because it provides an excellent rendition of nuclear morphology and differential staining of the cytoplasm.

In the general evaluation of the cell, there are three broad principles 1. morphologic features of the nucleus are most critical to discriminate benign cells from malignant cells, 2. cytoplasmic features generally provide clues that are suggestive of the manner of cell differentiation (such as squamous versus glandular), and 3. a cytologic diagnosis almost always requires the consideration of multiple morphologic features for proper classification of cells. A Corollary to this last statement is that the diagnosis of malignancy always requires the consideration of multiple features. No single cytologic feature is diagnostic of malignancy.

NORMAL CELL

It is evident that the appearances of normal cells differ enormously according to the origin. The amount of cytoplasm may be scanty, or it may be abundant. Frost, when describing the normal cells, stresses the principles of roundness, uniformity, and predictability. The location of nuclei in cells is

of some diagnostic importance. Nuclear chromatin is typically evenly dispersed. In normal cells this membrane is uniform in thickness.

REACTIVE CELLS

Benign cells may reflect responses to many different external stimuli by profound changes in the morphology. The resultant cell forms have been called by various names including reactive cells, irritated cells, hyperplastic cells, hypertrophic cells, and proplastic cells.

THE DEGENERATE CELLS

Although cell degeneration and death are normal at the end of a cell's life span, they may also be an inductor of injury. Cell degeneration is significant to the cytopathologist because of its potential to be misinterpreted as malignancy. During degeneration the nucleus may become swollen and portions of the cytoplasm lost.

THE DYSPLASTIC CELL:

Cells in a state of gradual transition from normalcy to frank malignancy were described as “dyskaryotic“. Their nuclei were characterized by increasing nuclear enlargement, uniform coarsening and hyperchromasia of the chromatin, and thickening of the nuclear membrane. Their cytoplasam exhibited and increasing failure to mature and differentiate. The term dysplasia as applied to these dyskaryotic cells exfoliating from lesion of the uterine cervix was introduced by Reagan in 1953.

THE NEOPLASTIC CELL

The interpretation of a cell as malignant is a statement by the cytopathologist that the cell has the biologic ability to invade tissues and metastasize. It was started earlier in this chapter that no single morphologic feature allows prediction of malignancy. This concept can not be over emphasized because grievous diagnostic error occurs when this simple concept is ignored. Major criteria for malignancy are summarized in the cytology feature that define a cell as malignant are found principally with in the nucleus. The malignant

nuclei are abnormally enlarged and often highly variable among a population of cells they may show extreme abnormalities of nuclear shape, with sharp angulations and deep divot holes or folding of the nuclear membrane. This membrane which is uniform in benign cells can be variably thick and thin in the malignant nucleus.

EXFOLIATION

Spontaneously exfoliated cells are the mainstay of cytologic diagnosis, principally because of their ease of collection. Among the earliest demonstrations of the cytologic method were the diagnoses of lung cancer in cells exfoliated into sputum. Similarly, the cervical papanicolaou smear depends on cell exfoliation, albeit with the gentle coaxing by brush or spatula.

ADVANTAGES

1. It is a painless, bloodless, non-invasive, quick and simple procedure.
2. Suitable in patients with advance disease with poor general condition
3. Guards against false negative biopsy.
4. Post biopsy complications can be eliminated.

DISADVANTAGES

1. Relatively less information when compared to a histological slide.
2. Positive results are reliable but negative are not.
3. Suitable only for epithelial tissues or for tissues exfoliating cells into reasonably accessible sites.
4. It is only an adjuvant and not a substitute for a biopsy.
5. Interpretation requires a skilled cytopathologist.

False positivity is a common draw back for exfoliative cytology, but is it imminent". Answer is a big no. The reason in a majority of false positive cases lies in the users and not with the science. A false positive case may be due to "early minimal degenerative changes" resulting from processing artifacts like improper fixation or air drying causing "cell bleeding" and an increased N/C ratio and nuclear wrinkling. So, if the technique is good the results are always better.

TECHNIQUE

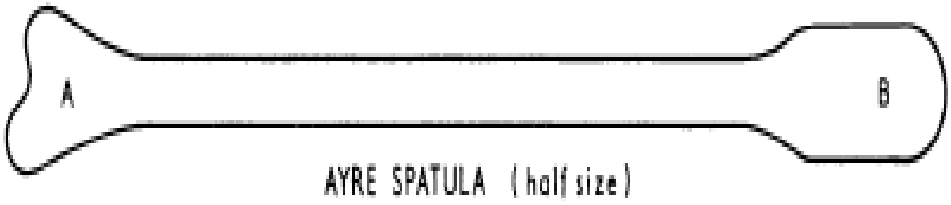
Requirements: two (or more) clean glass slides, fixative (95%ethyl alcohol, formalin, acetic acid), lead pencil, test request form, and staining.

Application of diagnostic techniques such as cytomorphometry, DNA cytometry, molecular analyses and toluidine blue staining techniques and also application of sophisticated computer programs has changed the scenario and made the interpretation of findings far more reliable than earlier.

Conventionally wooden spatula scrapings of buccal mucosa were a favourite, but due to the pressure on the cells and folding and alteration of cytoplasm during smearing, a cytobrush is now a preferred device.

Henry Sandler reviewed various other techniques which included cotton tip applicators, vigorous normal saline rinse, forceful aspiration of cells from the surface, aspiration of resting saliva from the floor, etc, and discussed the pros and cons of each. Ayre spatula is being used in cervical cytology.

After gargling / cleaning the lesion gently scrape the area of abnormality with a wooden tongue spatula. Remove one of the slides from the fixative and evenly smear the collected material on one of the slides. Immediately re immerses the slide in fixative. Repeat the process with the second slide if necessary for better diagnostic yield. Repeat the process for additional areas if necessary.



AYRE SPATULA (half size)

CYTOBRUSH

The Cytobrush has been used frequently in cervical cytology, but as yet its value in oral exfoliative cytology has not been assessed. A study was undertaken to compare the efficiency of the Cytobrush with that of the wooden tongue spatula.

Cytobrush produced significantly better dispersion for the dorsal tongue, ventral tongue and buccal mucosa and a better cell yield for the tongue surfaces. No significant difference for cell yield or dispersion was found for the hard palate. The study showed that the Cytobrush is an effective instrument for use in exfoliative cytology of normal oral mucosa.

Brushing is the favoured method for collecting many specimens. In the uterine cervix, the transformation zone, or squamocolumnar junction, is best sampled by a brush. Brushing of the oesophagus, stomach, lung or colon is commonly performed during endoscopic examination. Endoscopic brushing can specifically sample a visible lesion. A major pit fall in the evaluation of brush specimen is the risk of misinterpretation of a sample as abnormal, simply because many cells are present. Although, brushing techniques characteristically recovered large numbers of cells, that time itself does not indicate that the sample is malignant. Cells morphologic features of malignancy must be present.

Oral cells can be obtained by different physical systems of scraping the surface of the mucosa, by rinsing the oral cavity or even by taking a sample of saliva from the patients. The reliability of the different instruments used in oral exfoliative cytology has been reviewed in different studies.

The ideal instrument used for making a good cytological smear should be easy to use in any location, cause minimum trauma and provide an adequate and representative number of epithelial cells. It has been shown that a brush is an adequate instrument due to its ease in sampling and to the quality of the oral cytologic sample.

Brush biopsy is a simple, relatively inexpensive, high sensitive, risk-free method of screening for cancer and serves as an aid to the clinical examination. The improved accuracy is attributed to the ease in obtaining full transepithelial cellular samples and the evaluation of smears with an image analysis system that has been adapted specifically to detect oral epithelial abnormalities by some workers. Full-thickness sampling (indicated by pinpoint bleeding during procedure is essential if histomorphological, evaluation of the collected cells is to yield representative findings. For example, many dysplastic lesions are first identified in the basal epithelial layers, and the diagnostic histomorphological findings may be lost as the cells mature and parakeratin and keratin are produced. To the classical applications of the oral cytologic studies, such as oral candidiasis, others have been added, such as studying the epithelial infection due to Epstein-Barr virus in oral lesions of hairy leukoplakia, widening its possibilities.

The importance of brush biopsy has been recently emphasized in a multicenter study where nearly 5% of clinically benign-appearing mucosal lesions were sampled by this technique and later confirmed by typical scalpel biopsy to represent dysplastic epithelial changes or invasive cancer. Other authors have also demonstrated the ability of the brush biopsy to uncover similar type lesions that were not clinically suspicious for

carcinoma or preinvasive disease. There are controversies related to the real value of this technique in the early detection of OSCC. The existence of false positives has been pointed out showing high sensitivity (90%) and low specificity (3%). Nevertheless, these data have been discussed previously.

In a recent study by Potter et al., four false negatives of a total 115 analysed cases were found. Although the number of false positive cases is small it is important to emphasize that the mean delay time in diagnosing a carcinoma in these cases was of 117.25 days. However, more independent studies analysing its true validity and reliability as well as its applicability and its comparison with other techniques are necessary.

Multiple studies with different results have been carried out, analysing the application of the cytology in the detection of dysplastic lesions. In a study from Sudan, oral scrape smear cytological analysis has been proposed as a useful early diagnostic method for epithelial atypia and therefore also for malignant oral lesions .Despite the improvements in the methods used for collecting oral cytological material this methodology still presents problems in diagnosing oral cancer. Problems are mainly due to the existence of false negatives obtained as a result of a non representative sample as well as the subjectivity of the cytologic evaluation.

RECENT ADVANCES

1. Liquid-based-cytology
2. Cytomorphometric analysis

LIQUID BASED CYTOLOGY

The liquid based cytology (LBC) corresponds to a sampling where cells are put in liquid suspension. For the clinician, the sample is made the same manner as that of the conventional smear by using a plastic brush, which can take the squamo-columnar junction and the endocervix, or by combining the use of a spatula and an endocervical brush. The taken material is then immediately rinsed in the bottle, which contains a fixative allowing transport to the laboratory. A part of the sizable brush can be left in the bottle. The clinician does not have to deal with any spreading, which is done at the laboratory.

Currently two technical methods, which use automats, were validated by Food and Drug Administration (FDA) and are used frequently. One is proceeding by filtration and collecting cells vacuum-packed on a membrane with transferring cells on a glass (ThinPrep®, Cytyc®). The other is proceeding by centrifugation and sedimentation through a gradient of density (Surepath®, Tripath Imaging®). Cytoscreen System® (SEROA®), Turbitec® (Labonord®), CellSlide® (Menarini®) and Papspin® (Shandon®) technics are centrifugation and sedimentation manual techniques, which do not use automate and do not require a FDA agreement. They become established in Europe since 2003.

Spreading out in thin layer which results from these techniques eliminates a great part of the inflammatory cells, necrosis and of red blood cells, outcome to "a cleaning" of spreading out. The LBC makes it possible to avoid the majority of the artefacts of superposition of the conventional smear but the dispersion of the cellular material removes also usual visual reference marks. The cytologists are used to reading smears fixed in a liquid for the urines, the serosa or the ovaries. It imposes an analysis element by element and a training at least 6 months to readjust the morphological criteria. The cells are not flattened on the support but deposited and the pictorial aspects are some

modified. The nuclei are not hyper chromatic any more but take a vesicular aspect. The cytoplasms are important to differentiate the cellular origin.

APPLICATION OF TECHNIQUES

RESPONSE TO RADIATION THERAPY

Radiotherapy is frequently used as a standard treatment for locally advanced carcinoma of oral cavity. Although the response of malignant tumours and surrounding normal tissue to various doses of ionizing radiation is generally predictable, variability in the host-tumour reaction in a specific individual makes the response unpredictable.

The cytological evaluation of sequential oral smears during radiation therapy presents a unique opportunity to study the radiation response of oral malignant tumours. Earlier reports have described various cytoplasmic and nuclear changes in a variety of malignant cells evaluated by cytology after radiation therapy and included cellular enlargement, vacuolization, cytoplasmic granulation, nuclear enlargement, pyknosis, karyorrhexis, karyolysis, multinucleation, micronucleation, nuclear budding and

binucleation Later on micronucleation was accepted as a reliable indicator for monitoring the effectiveness of chemopreventive agents against cancer and for monitoring the toxicity of chemicals. In a study comparing the post-radiation changes in normal and malignant oral cells it was found that various morphological abnormalities demonstrated a consistent significant increase with radiation dose.

Scotland was the first European country to integrate LBC in an organized screening program. This decision was made on the results of a study of 70 000 smears concerning 3 centres. Cost efficiency calculation was for the benefit of LBC because the rate of inadequate smears passed from 7 % with the conventional smear to 1 % with the smear in liquid medium.
The definition of an inadequate smear in Scotland and England includes the smears deprived of endocervical cells. This definition explains the high percentage of inadequate cells. In the pilot study made in England, the rate of definite inadequate smear according to criteria's of the National Health System Cervical Screening Programs (NHSCSP) is from
9.1 % with the conventional smear to 1.6 % with LBC.

It was concluded that no evidence is available to claim higher accuracy of LBC to predict histologically confirmed CIN2+, but recognized that LBC improves the quality and speed of interpretation, and offers the possibility of additional molecular testing.

Therefore both CP and LBC for screening in Europe are recommended. Preferences should be determined depending on local economical considerations.

CYTOMORPHOMETRIC ANALYSIS

Ogden et al. suggested that quantitative techniques, based on the evaluation of parameters such as nuclear area (NA), cytoplasmic area (CA), and nucleus-to-cytoplasm area ratio (NA/CA), may increase the sensitivity of exfoliative cytology for early diagnosis of oral cancers, since these techniques are precise, objective and reproducible. Cowpe et al. demonstrated that exfoliative cytology is capable of detecting malignant changes, through estimation of NA/CA using the planimeter method in Papanicolaou-stained smears.

This study, published in 1985, concluded that 50 cells were sufficient to provide indication of malignant changes. Since then, a number of studies have been carried out using the technique described by these authors to evaluate the influence of diverse systemic and external factors on NA, CA and NA/CA. In these studies planimeters have been replaced by semiautomatic image analysis techniques, which are faster, more accurate and more reproducible.

Cowpe et al. found that tissues undergoing malignant transformation typically show a reduction in CA before the reduction in NA. They also suggested that samples of healthy mucosa from the same patient provide the best control. Ramaesh et al. used cytomorphometric techniques to assess nuclear diameter (ND) and cytoplasmic diameter (CD) in normal oral mucosa, in dysplastic lesions and in squamous cell carcinomas. They found that CD was highest in normal mucosa, lower in dysplastic lesions, and lowest in SCCs. By contrast, ND was lowest in normal mucosa, higher in dysplastic lesions, and highest in SCCs.

These studies suggested that reduced nuclear size and increased cytoplasm size are useful early indicators of malignant transformation, and thus

exfoliative cytology is of value for monitoring clinically suspect lesions and for early detection of malignancy.

Nuclear DNA content and DNA-image cytometry Static cytometry permits the quantification of DNA content in cells obtained by exfoliative cytology. However, routine Haematoxylin-Eosin staining is inadequate for this purpose, and special techniques are required to ensure that staining intensity is in proportion to DNA content. The Feulgen reaction meets this criterion, since it is a stoichiometric procedure: in other words, each fixed molecule of Schiff's reagent corresponds to a constant and equivalent portion of the DNA molecule. The advantage of this procedure is that staining intensities (and thus DNA contents) can be determined automatically by spectrophotometry or densitometry as well as digital image analysis.

Using cytology and DNA-image cytometry, it is easy to prove that oral lesions with the diagnosis of lichen planus and other inflammatory diseases show no suspicious cells. A recent review of literature places the rate of malignant transformation of lichen planus to squamous cell carcinoma at 0.2%. On the contrary, the presence of malignant cells was demonstrated in

one of 21 cases with leukoplakia (4.76%), in all cases with erythroplakia and in all squamous cell carcinomas.

A meta-analysis of 2236 cases of leukoplakia from five studies has revealed a range of malignant transformation of leukoplakia between 2.2 and 17.5%. Furthermore, Sciubba, Silverman et al. and Mashberg et al. emphasized the fact that erythroplakia, occurring as either an isolated lesion or as a component of leukoplakia (erythroleukoplakia) is a marker of severe epithelial dysplasia or carcinoma in situ. In fact, 90% of erythroplakia were histologically diagnosed as in situ or invasive carcinomas. In one study, it was shown that sensitivity of cytological diagnosis combined with DNA-image cytometry may reach 100%, whereas specificity was 97.4%. The authors reported a case of erythroplakia in which intraobserver variability among four pathologists led to diagnoses ranging from mild to severe dysplasia and because of the cytological and DNA cytometric diagnosis (severe dysplasia with DNA aneuploidy), this case was finally diagnosed on early cytological and DNA-cytometric diagnosis prior to the histological diagnosis.

Remmerbach et al have reported that sensitivity of cytological diagnosis combined with DNA-image cytometry was 98.2% and specificity 100%, when compared with the gold standard' of histology. In a study, Maraki et al. analyzed 150 patients with histologically proven epithelial dysplasia of which 36 developed squamous cell carcinoma. DNA-cytometry showed DNA-diploidy in 105 patients. 20 patients had DNA-polyploidy and in 25 patients DNA-aneuploidy was found at the time of the initial diagnosis.

Carcinoma developed in only three of the 105 diploid lesions when compared with 21 of the 25 aneuploid lesions. Remmerbach et al. concluded in the clinical setting that DNA-aneuploidy might detect histologically obvious malignancy, 1-15 months prior to histology. Sudbo et al. analyzed archival material and reported that the nuclear DNA-content in cells of oral leukoplakia may be used to predict the risk of oral epithelial dysplasia up to 5 years before histological diagnosis. Based on these observations, they proposed brush biopsies with cytological/DNA-cytometric examination for microscopic evaluation of white or red patches of the oral cavity (leukoplakia or erythroplakia).

Cytomorphometric analysis is useful in differentiating dysplastic and malignant squamous cells from normal squamous cell, discriminant analysis based on ND and CD values further increases the sensitivity and specificity.

Sensitivity; 89%,

Specificity; 89.7%,

Positive predictive value; 80%

Negative predictive value; 94.4%

Sensitivity of cytological diagnosis on oral smears for the detection of cancer cells was 95,0%, specificity 99,6%, positive predictive value 98,3% and negative predictive value 99,8%. On this basis the prevalence of DNA-aneuploidy in smears of oral squamous cell carcinomas in situ or invasive carcinomas was 96.6%. Sensitivity of DNA-aneuploidy in oral smears for the detection of cancer cells was 96,6%, specificity 100%, positive predictive value 100% and negative 99,2%. The combination of both techniques increased the sensivity to 98.3%, specificity to 100%, positive predictive value to 100% and negative to 99.6%.

	CYTOLOGY	DNA-CYTOMETRY	COMBINED DNA-CYTOMETRY AND CYTOLOGY
SENSITIVITY	95.0%	96.5%	98.3%
SPECIFICITY	99.6%	100%	100%
POSITIVE PREDECTIVE VALUE	98.3%	100%	100%
NEGATIVE PREDECTIVE VALUE	99.8%	99.2%	99.6%

cInstitute of Cytopathology, Heinrich Heine University, Moorenstraße 5, D-40225 DüsseldorfScrape.

RECENT APPLICATION:

A quick browsing through the search engines reveals that a number of special procedure can be performed on exfoliated cells like IHC, ICC, PCR., flow cytometry, image analysis, neural networking, interphase cytogenetics, southern blotting, special staining for infections, ISH,…. the list is long and never ending and demonstrates the scope of this branch in disease diagnosis.

PROLIFERATION INDEX AND AgNOR ANALYSIS

The Ki-67 antibody was first developed by Gerdes and coworkers, who demonstrated the antigen to be present in G1, S, G2 and M phases of continuously cycling cells, but absent in G0 cells. Since then, its utility as a proliferative marker for both diagnostic and research purposes has increased progressively. To the best of our knowledge there are no previous publications on the application of Ki-67 immunostaining to oral scrape smears even though histologic material from the oral cavity and cytologic smears from the uterine cervix have been extensively studied.

A pilot study conducted by Prashant Sharma (Departments of Pathology and Radiotherapy, Maulana Azad Medical College and associated Lok Nayak Hospital, New Delhi 2) , was carried out as a part of a larger project to study the feasibility of oral cytology in predicting response to radiotherapy. Cancer of the head and neck is amongst the commonest malignancies presenting to radiotherapy clinics in India, and the demand for economically viable and technically feasible prognostic tests is therefore intense

The comparatively much lower expression of Ki-67 in oral cytologic smears may have multiple reasons, the most obvious of which is the overall low yield of malignant cells in scrape smears. This has also been observed by other researchers Umiker et al for instance, found in an early series of 55 cases that scrapes from half the patients had 25% or less morphologically malignant cells. An additional reason could be that the Ki-67 labelling indices at the deep invasive fronts of tumours are higher than those at the centre or surface of mucosal cancers.

This indicates that actively proliferating cells are concentrated at the deep tumour margin, an area that obviously cannot be sampled by the superficial oral scrape. And finally, obscuring inflammation and blood, necrotic or proteinaceous debris and bacterial contamination often hamper cytologic

evaluation in these smears, a limitation that may be surmountable by the use of liquid based cytology.

Prior histologic studies on oral SCC have documented a radiation induced decline in the number of proliferating cells. The complete absence of any positive cells in our post therapy smears appears to corroborate this. However, it needs to borne in mind that the overall cellularity and especially the yield of malignant or dysplastic cells in the post-24 Gray smears was extremely low.

The few bizarre radiation altered cells that were present in these post-treatment smears have been considered to be genetically damaged and hence mitotically inactive cells by Bhattathiri et al.

In conclusion, Ki-67 expression is low in scrape smears from oral SCC. Considering that nearly 77% (33 out of 43) cases had a labelling index of zero even pretreatment and all positive ones were in the range of 0.1 to 0.01% indicates that Ki-67 immunostaining on conventional oral scrape cytology, though previously unreported in literature, is probably not the optimal tool for evaluation of proliferative status of oral squamous cell cancer.

MOLECULAR ANALYSIS

Nowadays cancer is considered as a process caused by the accumulation of multiple genetic alterations, which affect the cell cycle as well as normal cell differentiation. These alterations are mainly acquired (somatic) although some of them may be inherited and when they activate protooncogenes, inactivate tumour suppressor genes or affect enzymes, which repair DNA, they could lead to a neoplasic transformation.

Most of the oral cavity carcinogens are chemical (tobacco), physical (radiation) and infectious (papillomavirus, *Candida*) agents which act as mutagens and may cause changes in genes and chromosomes structures by point mutations, deletions, insertions and rearrangements However, some of these changes may occur spontaneously. These genetic alterations, which occur during carcinogenesis, can be used as targets for detecting tumoral cells in clinical samples

Molecular analysis can identify a clone population of cancerous cells that have tumour specific point mutations among normal cells.

Mutations in the tumour suppressor gene p53 are the most frequent genetic alterations in human cancer and show a variable frequency in oral cancer several authors have studied and in some cases demonstrated the potential clinical application of oral cytology for detecting point mutations in p53 as a specific neoplastic marker in OSCC. However, some authors consider that the high number of point mutations, which can be found in p53, limits its potential clinical application in cost-effective early detection of oral cancer. The applicability of other molecular markers such as epigenetic alterations (hypermethylation of promoter regions) and the genomic instability such as loss of heterozygosity (LOH) and microsatellite instability (MSI) has also been studied.

EPIGENETIC ALTERATIONS, LOSS OF HETROZYGOSITY AND MICROSATELLITE INSTABILITY

The main epigenetic modification in tumours is methylation and it seems that the changes in the methylation patterns can play an important role in tumourogenesis. These epigenetic alterations are often associated with the loss of genetic expression and their occurrence seems to be essential for the multiple necessary genetic events. So tumoral progression takes place because these alterations can inactivate DNA repairing genes. The

hypermethylation of CpG islands, which are usually unmethylated, in promoter regions, is correlated with the loss of gene expression.

Rosas et al. studied the methylation patterns of p16, MGMT and DAP-K genes in carcinomas and smears of patients suffering head and neck cancer. They detected abnormal hypermethylation patterns in both kinds of samples by a methylation specific PCR. That is why they proposed that this technique allows a sensitive and efficient detection of tumoral DNA and it is potentially useful for detecting and monitoring recurrences in these patients.

Usually the genetic instability is determined by LOH, which reflects an allelic loss in the genomic region where the locus marker stands, as well as by MSI, which implies a change in the length of the microsatellite loci. Several studies have demonstrated by using microsatellite markers that alterations in certain regions of chromosomes 3p, 9p, 17p and 18q are associated with the development of head and neck squamous cell carcinomas.

Microsatellite regions are distributed along the genome and have been widely and satisfactorily used as molecular markers for carcinogenesis. Alterations in these regions have been used as clonal markers and for detecting tumoral cells among normal cells. Analysis of these regions can reveal LOH or MSI in the studied region.

Several authors have evaluated the analysis of microsatellite loci (LOH and MSI) in oral cytologic samples and tumoral tissue. They observed that the profile of changes produced in the tumoral tissue was similar to the one observed in the cytologic samples. They reached the conclusion that this kind of analysis allows the detection of DNA from tumoral cells of the cytologic samples. Spafford et al. also pointed out that when trying to detect tumoral cells among normal cells in oral cytologic samples markers used for studying MSI were more efficient that the ones used for LOH. The applications of oral cytologic molecular studies in oral precancer have been minimally studied may be due to the difficulty in obtaining representative material of these lesions.

Applying the brush biopsy methodology, apoptotic biomarkers in cells obtained by displasic leukoplakias and lichen planus have been analysed. It is important to remark that apoptotic cells present the same morphology than non-apoptotic. That is why it is important to apply these techniques to differentiate them. In this study a high percentage of apoptotic cells in patients with leukoplakia or lichen planus have been demonstrated.

In a recent study another controversial aspect such as the infection by human papillomavirus (HPV) has been investigated in patients with proliferative verrucous leukoplakia comparing them with patients with simple leukoplakia using for this purpose cytologic analysis of oral cells. The results show no representative differences in the detection between both groups of HPV DNA.

In conclusion we can point out that oral cytology is re-emerging as a diagnostic tool in oral precancer and cancer as the result of applying new physical as well as molecular methodological techniques.

NUCLEAR DNA CONTENT AND DNA-IMAGE CYTOMETRY

Static cytometry permits the quantification of DNA content in cells obtained by exfoliative cytology. However, routine Haematoxylin-Eosin staining is

inadequate for this purpose, and special techniques are required to ensure that staining intensity is in proportion to DNA content. The Feulgen reaction meets this criterion, since it is a stoichiometric procedure: in other words, each fixed molecule of Schiff's reagent corresponds to a constant and equivalent portion of the DNA molecule. The advantage of this procedure is that staining intensities (and thus DNA contents) can be determined automatically by spectrophotometry or densitometry as well as digital image analysis.

IMMUNOHISTOCHEMICAL IDENTIFICATION OF TUMOUR MARKERS

The identification of tumoral markers, notably cytokeratins in smears from the oral cavity has attracted considerable interest. Cytokeratin expression profile provides useful information on cell differentiation status but its potential for early diagnosis of oral cancer is limited. However, certain cytokeratins, such as K8 and K19 are useful if not definitive indicators of malignancy, particularly if their presence is interpreted in conjunction with other information, such as DNA profile.

PCR/MICROFLUOROMETRY

Cervical cancer screening is conducted by a cytological Papanicolaou (Pap) test. For screening, it is becoming increasingly important to introduce a more objective result, based on human papillomavirus (HPV) DNA test. We describe here a practical method allowing the mass detection of HPV-DNA by PCR followed by fluorogenic DNA intercalation using cervical scrapes or biopsy specimens obtained from women who had undergone cytological testing for cervical cancer. Crude DNAs were extracted by a simplified proteinase K-boil method. Common and type-specific primers were newly designed for major types of high-risk HPVs. A fluorogenic DNA intercalator, SYBR® Green I was directly added to the specific PCR products. The resultant fluorescence was measured by a conventional fluorometric microplate reader. *Results*: The proposed PCR/microfluorometry (MFL) allowed a simple, rapid and economical detection of HPV-DNA without any use of labelling primers or probes. HPV-DNAs were found in 48.2% (123/255) of the cervical scrapes. The detection rate of HPV in cervical cancer biopsy specimen was 92.4% (61/66). *Conclusions*: PCR/MFL detection of HPV-DNA, followed by combined type-specific PCR, is

expected to be an extremely useful tool in cervical cancer screening.(Department of Pathology, Sapporo Medical University, Japan.)

MATERIAL AND METHODS

A prospective study of 207 cases of mucocutaneous malignancies for comparative study of scrape cytology and biopsy were taken both as an outpatient and inpatient in the department of surgical oncology Government Royapettah Hospital in the period between July 2006 and May 2009. Out of 207 cases, Head and Neck cancers were 125 cases both primary and follow-up cases, cervical cancers were 53 both primary and follow-up cases, skin cancers were 21 both primary and follow-up cases, penile cancer 7 and anal canal cancer 1. Type of lesions such as proliferative, ulcerative, infiltrative and verrucous lesions and also presence or absence of infections was assessed clinically.

NEW CASES

TYPE OF MUCOCUTANIOUS CANCER	**TOTAL NUMBER OF CASES**
HEAD AND NECK CANCER (Tongue, Buccal mucosa, Alveolus, Palate, Lip)	98
LOWER GENITO URINARY CANCER (Vulva, Vagina, Cervix)	44
SKIN CANCER	19
ANAL CANAL	1
PENIS	7

FOLLOW UP CASES

TYPE OF MUCOCUTANIOUS CANCER	TOTAL NUMBER OF CASES
HEAD AND NECK CANCER (Tongue, Buccal mucosa, Alveolus, Palate, Lip)	27
LOWER GENITO URINARY CANCER (Vulva, Vagina, Cervix)	9
SKIN CANCER	2
ANAL CANAL	0
PENIS	0

PREPARATION

For all cases before proceeding for scraping, advised gargling in case of oral cancer \ Cleaning in other mucocutaneous lesion. Biopsies were done in all cases simultaneously following scraping.

REQUIREMENTS FOR THE STUDY AS FOLLOWS

Two (or more) clean glass slides

Fixative (95% ethyl alcohol), formalin, acetic acid

Scraping spatula

Lead pencil

Test request form

Staining

TECHNIQUE

After cleaning the lesion, the lesion was scraped gently with a wooden tongue spatula or ayres spatula in the case of cervical cancer.

Evenly smeared the collected material on one of the glass slide, air dried or immediately immersed the slide in fixative. In our study we use both dry and wet preparations and repeated the process with the second slide in case of verrucous growth or post radiation follow up cases, if necessary for better diagnostic yield. In our study we repeated the process in few cases. Labelled the slides with lead pencil and placed in a container filled with 95% ethyl alcoho

STAINING PROCEDURE:

All slides were stained in pathology laboratory by following the steps given below.

Fix smear in 10% neutral buffered formalin at the room temperature for 20 seconds.

Rinse in tap water.

Stain in harris's (progressive) hematoxylin for 1 min.

Wash well in tap water for 10 – 20 sec,.

Stain in 1% aqueous eosin for 10 sec,.

Rinse in tap water.

Dehydrate, clear and mount.

All slides were reported by single pathologist on the same day.

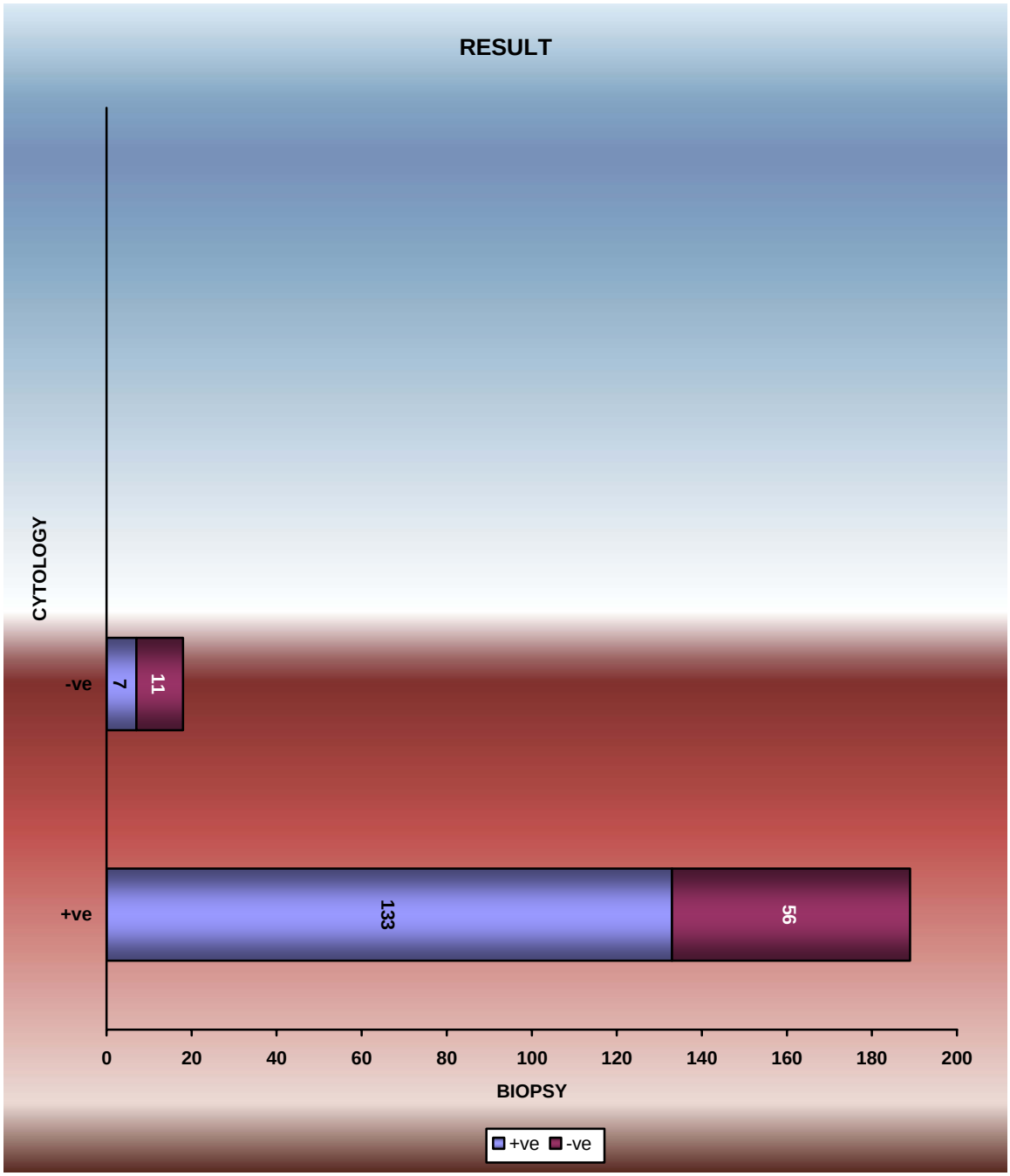
RESULTS AND OBSERVATION

RESULTS

Out of 207 cases of scrape cytology true positive cases were 133 cases, true negative cytology were 56 cases, false positive cytology were 7 cases, false negative cytology 11 cases as depicted in the tabular column and in the bar diagram

RESULTS

	BIOPSY		
CYTOLOGY	+VE	- VE	TOTAL
+VE	133	7	140
-VE	56	11	67
TOTAL	189	18	207


RESULT
CYTOLOGY
-ve
+ve
7
11
133
56
0
20
40
60
80
100
120
140
160
180
200
BIOPSY
+ve
-ve

From the above results Sensitivity, specificity, accuracy, positive predictive value, negative predictive value are calculated using the formula below,

Sensitivity = TP/ TP + FN

Specificity = TN/ TN + FP

Positive predictive value = TP / TP + FP

Negative predictive value = TN / TN + FN

Accuracy (A) = TP + TN / TP + FP + TN + FN

OVERALL RESULT

True Positive: 133

False Positive: 7 (Post radiation Lesions)

False Negative: 56

True Negative: 11.

Sensitivity 70.3%,

Specificity 61.1%

Accuracy 69.5%

Predictive value of positive cytology; 94.8%

Predictive value of negative cytology; 16.9%

Sensitivity of cytological diagnosis on oral smears for the detection of cancer cells in different studies were 95,0%, specificity 99,6%, positive predictive value 98,3% and negative predictive value 99,8%. In various studies Scrape cytology sensitivity and specificity were 26% and 97%, respectively in cervical lesion. (Eftekhar etal)

METHODS TO INCREASE SENSITIVITY & SPECIFICITY:

QUANTITATIVE ANALYSIS:

Sensitivity and specificity of cytology can be increased by quantitative cytomorphometric analysis which is useful in differentiating dysplastic and malignant squamous cells from normal squamous cell

Discriminant analysis based on ND and CD values increases sensitivity from conventional technique .A comparative study at Institute of Cytopathology, Heinrich Heine University, Moorenstraße .compared conventional cytology, DNA-cytometry and combining both increases the

Sensitivity by 98.3%

Specificity by 100%

Positive predictive value by100%

Negative predictive value by 99.6%

LIQUID-BASED CYTOLOGY:

Since liquid-based cytology was developed in the 1990s various comparative studies have shown that it can offer significant advantages over conventional exfoliative cytology. In cervical uterine cancer screening, the liquid-based preparations have also demonstrated a significant reduction in false-negative rates as compared with those of conventional smears In a recent study from

Brazil the liquid-based preparations resulted in higher specimen resolution as well as presenting a better cytological morphology for, squamous cell carcinomas,

Liquid-based cytology has been developed as an alternative and has been reported to increase the sensitivity of smear tests and decrease the proportion of slides that are unsatisfactory for assessment.

In the pilot study made in England, the rate of definite inadequate smear according to criteria's of the National Health System Cervical Screening Programs (NHSCSP) is from 9.1 % with the conventional smear to 1.6 % with LBC.

CYTO BRUSH

Cytobrush is an effective instrument for use in exfoliative cytology to collect cells. Its advantages are it avoids pressure on the cells, avoids folding, and alteration of cytoplasm during smearing.Hence cytobrush is now a preferred device for cell collection.

STAINIG & SLIDE PREPARATION

The advent of techniques like Toluidine blue staining, brush biopsy and application of sophisticated computer programs has changed the scenario and made the interpretation of findings far more reliable than earlier.

Currently, two technical methods, which use automats, were validated by Food and Drug Administration (FDA) and are used frequently. One is proceeding by filtration and collecting cells vacuum-packed on a membrane with transferring cells on a glass (ThinPrep®, Cytyc®). The other is proceeding by centrifugation and sedimentation through a gradient of density (Surepath®, Tripath Imaging®). Cytoscreen System® (SEROA®), Turbitec® (Labonord®), CellSlide® (Menarini®) and Papspin® (Shandon®) techniques are centrifugation and sedimentation manual techniques, which do not use automate and do not require a FDA agreement.

In our study we followed conventional techniques such as wooden spatula for scraping, air dry or wet slide preparation, heamatoxilin and eosin staining with conventional microscope for cytophalogical study. Hence sensitivity

(70.3%), specificity (60.1%) which is low when compared to the other international studies.

In our study false positive cases were 7, these false positive cases were all post radiation follow up cases. Scrape cytology was positive for malignancy and biopsy was negative for malignancy. Hence, we repeated scrape cytology second time, which was reported as negative for malignancy. We concluded that initial positive slide was due to radiation induced decline in proliferative cell and misinterpretation of nuclear changes as positive. We kept all these cases under regular follow up

56 slides were reported as false negative, the reasons could be

Low concentration of proliferating cells on the surface of the lesion which is due to the following reasons,

Infection (bacterial colonies, inflammatory cells)

Anucleate squames,

Proteinaceous material,

Verrucous carcinoma,

Infiltrative lesion,

Radiation induced decline in proliferation.

Out of 207 cases, 189 cases were positive in biopsy, 18 cases were negative this could be due to biopsy from non-representative areas and inadequate sampling. More over us have not compared biopsy with final histopathology report.

In our study we emphazise that patients with trismus and posterior 1/3 tongue lesions and patients who refuses biopsy, scrape cytology is a more useful technique for rapid diagnosis when compared to biopsy which may need hospitalisation and anaesthesia.

CONCLUSION

Biopsy is the Gold Standard procedure for the diagnosis of mucocutaneous malignancies.

Scrape (exfoliative) cytology is a simple and noninvasive procedure, which has been a controversial technique according to its real validity. In recent times it has re-emerged due to its application in mucocutaneous cancer as a diagnostic and predictive method as well as for monitoring patients.

Rationale of exfoliative cytology lies in loss of cohesiveness of cells, proliferating cells and proplastic cells (Cell with an increased activity).

The results of the current study demonstrate that scrape cytology is a reliable rapid screening and diagnostic procedure in the outpatient setting for mucocutaneous malignancy. The duration of the scrape cytology process takes 20 min as against 3 to 4 days for biopsy.

It is a painless, bloodless noninvasive, quick and simple procedure.

In our study the Sensitivity is 70.3% and positive predictive value is 94.8% as against 95% and 98% respectively in other studies. Positive scrape

cytology is reliable for clinical decision making, but negative scrape needs confirmation by biopsy. Scrape cytology is not reliable in follow up cases, especially in post RT situations. In our study false positive cases were 7, these false positive cases were all post radiation follow up cases. We concluded that positive slides were due to radiation induced decline in proliferative cell and misinterpretation of nuclear changes as positive.

In our observation from this study scrape cytology is more sensitive in proliferative and ulcerative lesions and less sensitive in infiltrative and verrucous lesion due to less number of proliferative cells and keratinisation.

Scrape is not an alternative to biopsy.

Scrape cytology guards against false negative biopsy.

In posterior 1/3 tongue lesion, oral cancer patients with trismus and in patients who refuses biopsy, scrape cytology is useful.

In our study it is clear that the Sensitivity and specificity can be further improved by application of newer techniques such as Cytobrush, liquid based cytology, Cytomorphometric analysis and by trained Cytopathologist, thereby making this cytological technique as a more reliable diagnostic and predictive method as well as for monitoring patients.

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PROFORMA
COMPARATIVE STUDY OF SCRAPE CYTOLOGY AND BIOPSY IN MUCO CUTANEOUS MALIGNANCY

S. No.: IP No.:
Name; CD No.:
Age; Date:
Sex M/F
Scrape
Occupation:
Cytology No:
Address:
Biopsy No.:

1.
Punch biopsy

2.
Wedge Biopsy

DIAGNOSIS:
PRIMARY/RESIDUAL/RECURRENCE

Staging:

Site of Growth:

Oral Cavity

Lip

Palate

Buccal Mucosa

Gingiva

Tongue

Floor of the Mouth

Skin

Genitals

Female

Vulva

Vagina

Cervix

Male: Penis

Anus

Size of Growth:

Oral Cavity: T1 T2 T3 T4

Skin : T1 T2 T3 T4

Genitals

Female

Vulva : T1 T2 T3 T4

Vagina : T1 T2 T3 T4

Cervix : IA1 IA2 IIA IIB

IIIA IIIB IVA IVB

Male Penis: T1 T2 T3 T4

Anus : T1 T2 T3 T4

Type of Lesion

Ulcerative :

Proliferative Growth:

Verrucous Lesion :

Infection Present Absent

Oral Cavity : No N1 N2a N2b

N2c N3

Skin : No N1

Genitals

Vulva : N0 N1

Vagina : N0 N1 N2

Cervix : N0 N1

Male Penis : N0 N1 N2 N3

Anus : N0 N1 N2 N3

Previous Treatment

RT : Yes or No

MODE : EBRT

Branchy Therapy

EBRT+ Branchy Therapy

Total Dose:

Number of Fractions

Dose per Fractions

Treatment Break : Yes/No

Chemo Therapy : Yes/No

REPORT:

Scrape Cytology:

Punch Biopsy: SCC

1. **Infiltrating Keratinising**
2. **Infiltrating Non Keratinising SCC**

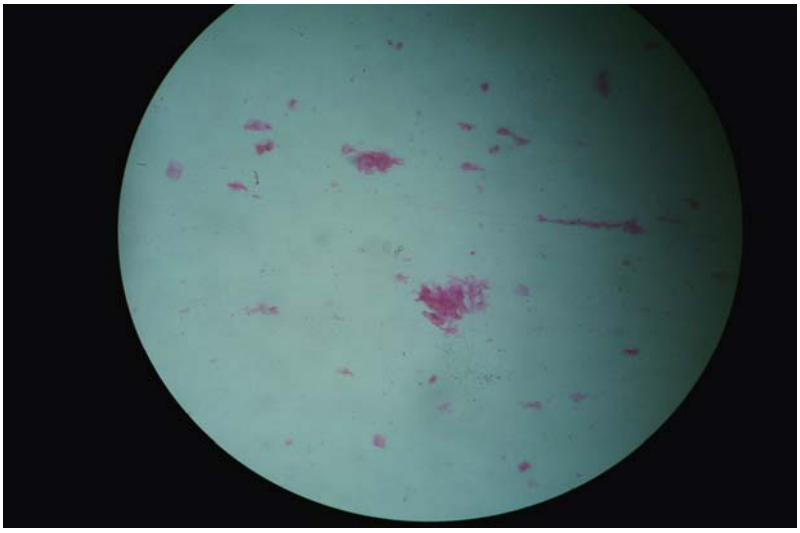
BCC

MELANOMA

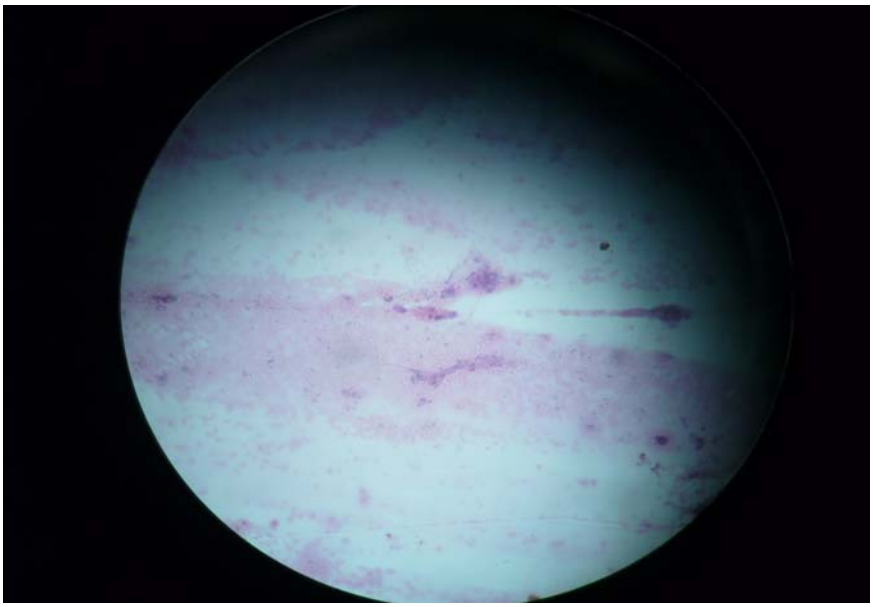
OTHERS

SCRAPE IN POSTERIOR 1/3 TONGUE LESION

SCRAPE IN POSTERIOR 1/3 TONGUE LESION WITH TRISMUS

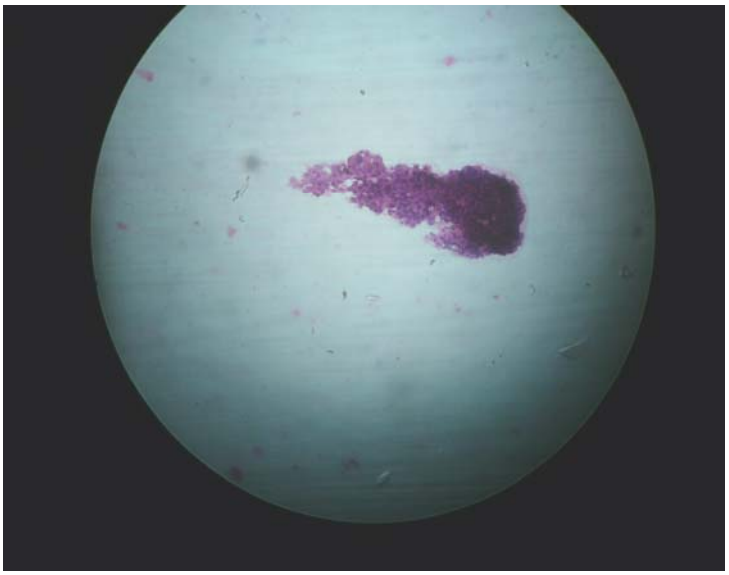


NORMAL SQUAMOUS CELL



SQUAMOUS CELL CA

SQUAMOUS CELL CA



SQUAMOUS CELL CA

MASTER CHART

S.NO	NAME	AGE/SEX	IP/OP NO	DIAGNOSIS	STAGE	INFECTION (CLINICAL	pos or neg	SCRAP CYTOLOGY NO.	REPORT	BIOPSY NO	REPORT	pos or neg
1	VENKATAMAL	45/F	851008	CA CHEEK RT	T3N1MO	-	1	1408/06	POSITIVE FOR MALIGNANT CELLS	1342	INFILT NON KERT SCC	1
2	NALKMMAL	70/F	849876	CA CHEEK RT	T3NOMO	+	2	1427/06	ATYPICAL NUCLEI FRANKLY MALIGNANT CELLS NOT SEEN	1307/06	INFILT NON KERT SCC	1
3	MASILAMANI	65/M	849956	REC SCC BACK	T4N2M0	-	1	1431/06	POSITIVE FOR MALIGNANT CELLS	1389/06	INFILT NON KERT SCC	1
4	KEPPAMAL	67/F	851690	CA BUCCAL MUCOSA	T2N0M0	+	2	1435/06	BENGIN SQUAMOUS CELLS	1359/06	INFILT NON KERT SCC	1
5	TAMILARASI	35/F	851268	CA VULVA	T2N1M0	+	2	1437/06	BENGIN SQUAMOUS CELLS	1374/06	INFILT SCC	1
6	SHANTHI	26/F	851695	CACX IB	IB	+	2	1441/06	SUSPECIOUS OF MALIGNANT CELLS	1369/06	INFILT SCC	1
7	MAGESWARI	40/F	853890	CACX	IB1	-	2	1453/06	MALIGNANT CELLS NOT SEEN	1382/06	INFILT KER SCC	1
8	ANANDAMMA	70/F	856745	CACX		-	2	1446/06	SEVERE DYSPLASIA	1393/06	INFILT KER SCC	1
9	MATHIAMMAL	75/F	856634	CACX IB	II B	-	1	1449/06	POSITIVE FOR MALIGNANT CELLS	1403/06	NON KERT SCC	1
10	VANNA MAYIL	60/F	858923	CACX IIB	II B	-	1	1453/06	POSITIVE FOR POORLY DIFF SCC	1408/06	INFL KERT SCC	1
11	SAROJAMMAL	58/F	858834	CACX POST RT	IIB POST RT	-	1	1455/06	POSITIVE FOR MALIGNANT CELLS	1410/06	INFL KERT SCC	1

12	NEELAVATHI	75/F	522198	CA CHEEK REC	YRT2N0M0	-	1	1467/06	POSITIVE FOR SCC	1467/06	INFL KERT SCC	1
13	KANDASWAMY	70/M	851109	SQUAMOUS CELL CARCINOMA LT THIGH	T4N1M2	-	2	1473/06	BENGIN SQUAMOUS CELLS	1460/06	INFL SCC	1
14	JAYARAMAN	60/M	853434	REC LT PNS POST RT/CHEMO	YRT2N0M0	+	2	1483/06	BENGIN SQUAMOUS CELLS	1470/06	INFL SCC	1
15	RADHA KRISHNAN	50/M	852820	CA POST 1/3 TOUNGE	TXN2CM0	+	2	1489/06	BENGIN SQUAMOUS CELLS	1430/06	INFL SCC	1
16	LAKSHMIAMMAL	45/F	853256	CA TONGUE	T94N2BM0	-	1	1491/06	INFILT KEARTINIZING SCC	1433/06	INFL SCC	1
17	DEVANATHAN	45/M	853004	CA TONGUE POST RT	YRT49N2BM0	-	2	1050/06	BENGIN SQUAMOUS CELLS	1388/06	INFL KERT SCC	1
18	MUNUSWAMY	65/M	852197	CA TONGUE POST RT	T3N1M0	-	1	1054/06	POSITIVE FOR MALIGNANT CELLS	1459/06	INFL KERT SCC	1
19	MUTHUSWAMY	50/M	853332	CA TONGUE POST RT	TXN29M0	+	2	1059/06	BENGIN SQUAMOUS CELLS	1461/06	INFL KERT SCC	1
20	THANGAMMAL	63/F	852204	REC CA BUCCAL MUCOSA	T2N0M0	-	2	1061/06	BENGIN SQUAMOUS CELLS	1465/06	INFL KERT SCC	1
21	GOPALAKRISHNAN	75/M	837292	MINOR SALIVARY GLAND TUMOR	TXN0M0	+	2	1052/08	NEGATIVE FOR MALIGNANCY	1472/06	VERRUCUS CA	1
22	SELVAMANI	47/M	853325	CA SOFT PALATE	T2M0N0	-	1	1051/08	MODERATELY DIFFERENTIATED SCC	1469/06	INFL KERT SCC	1
23	BAKIYALAKSHMI	63/F	854220	RECURRENT CA BUCCAL MUCOSA	YRT1N0M0	-	2	1074/06	BENGIN SQUAMOUS CELLS	1503/06	INFL KERT SCC	1

24	BARTHASARAQTHY	55/M	854241	CA TONSIL	T4AN1MX	+	2	1058/06	? MALIGNANT CELL	1552/06	INFL SCC	1
25	CHANDRA	40/F	854697	CA ANTERIOR VAGINAL WALL	T3N0M0	-	1	1077/06	POSITIVE FOR MALIGNANT CELL	1509/06	POORLY DIF SCC	1
26	PAKRIAMMAL	45/F	854240	CA CERVIX	II B	-	1	1071/06	POORLY DIFF SCC	1513/06	POORLY DIF SCC	1
27	GOPALAKRISHNAN	63/M	1624/06	CA BUCAL MUCOSA POST RT	YRT2N0M0	-	1	1069/06	POSITIVE FOR SCC	1539/06	SCC LARGE CELLS	1
28	SOLAI	85/M	1596/06	CA CHEEK	T4aN1M0	-	1	1059/06	POSITIVE FOR SCC	1470/06	SCC WELL DIFF	1
29	CHANDRA	32/F	8540/37	CA CERVIX	VAULT REC	-	1	1046/06	POSTIVE FOR MALIGNANT CELL	1475/06	No EVIDENCE OF MALIGANCY	2
30	FATHIMA	65/F	8553/29	CA LOWER ALVEOLUS	YRT4aN1M0	-	2	1083/06	BENGIN SQUAMOUS CELLS	1476/06	SCC	1
31	SANTOSH	32/M	854699	CA CHEEK REC INFECTION PLUS	YRT4aN0	+	2	1086/06	BENGIN SQUAMOUS CELLS	1480/06	SCC	1
32	PACAIAPPAN	72/M	854784	CA PENIS	T2N1MO	-	1	1068/06	WELL DIFFERENTIATED SCC	1530/06	WELL DIFF SCC	1
33	LAKSHMI	33/F	1635/07	CHRONIC CERVICITIS		-	2	1074/06	BENGIN SQUAMOUS CELLS	1547/06	WELL DIFF SCC	1
34	KARTIGAYNI	58/F	855101	CA CERVIX	II B	-	1	1076/06	POORLY DIFF SCC	1549/06	INF KER SCC	1
35	ANNADAL	55/F	855809	CA VAGINA	CA CERVIX	-	1	1085/06	POSITIVE SCC	1550/06	INFL SCC	1
36	ANANDAYEE	52/F	388/99	CA CERVIX	IIB POST RT	-	2	1087/06	RT INDUCED CHANGES	1551/06	NO EVIDENCE OF MALIGNANCY	2

37	KODHAIAMMAL	48/F	8506027	CA ENDO CERVIX		-	1	1091/06	POSITIVE FOR MALIGNANT CELLS	1553/06	NO EVIDENCE OF MALIGNANCY	2
38	MARRY	39/F	856890	? CA CERVIX		-	2	1101/06	META PLASTIC SQUAMOUS CELL	1567/06	NO EVIDENCE OF MALIGNANCY	2
39	MANJULA	45/F	856409	CA TOUNGE ANT 2/3	T49N2BM0	-	1	1108/06	MODERATELY DIFFERENTIATED SCC	1571/06	INF SCC	1
40	ARUN KUMAR	32/M	856522	CA PENIS	T2N2M0	-	1	1110/06	MODERATELY DIFFERENTIATED SCC	1576/06	INF KER SCC	1
41	SHANTHI	47/F	856507	CA ENDO CERVIX		-	2	1111/06	GRADE1 NUCLEAR ATYPIA	1580/06	CHRONIC CERVICITIS	2
42	SELVAMANI	49/M	856577	CA TOUNGE ANT 2/3	T1N0M0	-	1	1112/06	POSITIVE MALIGNANT CELL	1584/06	INF CSCC	
43	RAJA	45/M	856031	CA FOM	T3N1M0	+	1	1115/06	POORLY DIFF SCC	1565/06	No EVIDENCE OF MALIGANCY	2
44	PONNUSWAQMY	58/M	1800/06	? URETHRAL CA		+	2	1119/06	INFLAMATORY SMEAR	1570/06	No EVIDENCE OF MALIGANCY	2
45	VISHLAM	37/F	1883/06	CHRONIC CERVICITIS		+	2	1135/06	INFLAMATORY SMEAR	1573/06	CHRONIC CERVICITIS	2
46	LAKSHMI	33/F	1635/06	CHRONIC CERVICITIS		-	2	1136/06	SQUAMOUS META PLASIA	1589/06	No EVIDENCE OF MALIGANCY	2
47	NARAYANAN	45/M	856/68	SCC RT FOOT	T3N1M0	+	2	1144/06	FRANKLY MALIGNANT CELL NOT SEEN	1597/06	INFL SCC	1
48	KUMAR	47/M	8575/13	CA TOUNGE ANT 2/3	T2N1M2	-	2	1145/06	BENGIN SQUAMOUS CELLS	1621/06	INFL SCC	1

49	NADHYA	38/F	8531/07	CA TOUNGE	T2N0M0	-	1	1146/06	POSITIVE FOR MALIGNANT CELLS	1670/06	INFL KER SCC	1
50	KABALI	70/M	857794	CA PENIS	T2N0M0	-	1	1147/06	POSITIVE FOR SCC	1670/06	INFL KER SCC	1
51	SAMMYAMMAL	55/F	858815	CA VULVA	T2N0M0	+	2	1159/06	FRANKLY MALIGNANT CELL NOT SEEN	1672/06	INFL KER SCC	1
52	ABDUL SATAR	58/M	854687	CA LIP	T3N0M0	-	2	1164/06	DYSPLASIA	1681/06	INFL SCC	1
53	MADAVILA	54/M	858934	RECURRENT CA CHEEK POST RT	T49N0M0	-	1	1165/06	POSITIVE FOR MALIGNANT CELLS	1693/06	INFL SCC	1
54	HUSSAIN	65/M	859235	CA TOUNGE ANT 2/3	T2N0M0	+	2	1166/06	BENGIN SQUAMOUS CELLS	1731/06	INFL KER SCC	1
55	ZIDIL HAG	56/M	859224	SCC RT GLUTEAL REGION	T4N1MO	-	1	1167/06	WELL DIFFERENTIATED SCC	1745/06	WELL DIFF SCC	1
56	KADAR KHAN	36/M	1435/56	CA TOUNGE	T2N29M0	-	1	1168/06	POORLY DIFF SCC	1765/06	INFL SCC	1
57	RANGITHAM	60/F	859139	CA LOWER ALVEOLUS	T2N29M0	-	2	1169/06	BENGIN SQUAMOUS CELLS	1766/06	INFL SCC	1
58	SHANTHA	41/F	859485	CA CERVIX IIB POST RT	2B POST RT	-	2	1170/06	BENGIN SQUAMOUS CELLS	1789/06	INFL SCC	1
59	MUNNUSAMY	60/M	860131	CA BUCCAL MUCOSA	T3N1M0	-	1	1185/06	POSITIVE FOR SCC	1793/06	SCC	1
60	THANGAM	60/F	861901	CA LOWER ALVEOLUS	T49N1M0	-		10/07	SCC	18/07	INFL KER SCC	1
61	MANDHAYAN	70/M	76/07	CA PENIS	T2N1M0	+	1	20/07	POSITIVE FOR POORLY DIFF SCC	47/07	INFL KER SCC	1

62	RAJESWARI	75/F	862344	? MELANOMA FOOT		-	1	24/07	POSITIVE FOR MALIGNANT CELLS	48/07	AMELANOTIC MELANOMA	1
63	RAJAPANDIAN	60/M	863228	CA CHEEK	T2N0M0	-		36/07	SCC	68/07	INFL KER SCC	1
64	NARAYANASWAMY	62/M	860701	CA RT CHEEK	T49N2CM0	-	1	1193/06	POSITIVE FOR MALIGNANT CELLS	78/07	INFL KER SCC	1
65	MUTHAYEEMAL	70/F	860644	CA VULVA	T2N1M0	-		1192/06	SCC	81/07	INFL KER SCC	1
66	VISALAM	37/F	8883/06	CHRONIC CERVICITIS		-	2	1197/06	SQUAMOUS META PLASIA	89/07	CHRONIC CERVICITIS	2
67	ELLAMMAL	69/F	231/07	CA CHEEK	T2N1M0	-	1	F59/07	POSITIVE FOR MALIGNANT CELLS	93/07	INFL SCC	1
68	ELUMALAI	50/M	864439	CA FOM	T4AN1M0	-	1	61/07	POSITIVE FOR MALIGNANT CELLS	111/07	INFL KER SCC	1
69	PONNUSWAMY	50/M	302/07	CA LIP	T2N0M0	-	1	65/07	POSITIVE FOR SCC	126/07	INFL KER SCC	1
70	PAKARISWAMY	52/M	865087	CA ALVELOUS	T3N1M0	+	2	F75/07	MATURE SQUAMOUS CELLS ONLY	152/07	SCC	1
71	MUTHUMAL	70/F	367/07	CA TONGUE	T2N0M0	-	1	F76/07	POSITIVE FOR WELL DIFF SCC	131/07	INFL KERT SCC	1
72	MAHALAKSHMI	47/F	865575	CA CHEEK	T3N0M0	-	1	C78/07	POSITIVE FOR SCC	163/07	INF KER SCC	1
73	MEENA	31/F	1522/06	CA CERVIX B POST RT/POST OP ?VAULT REC		-	1	86/07	FEW MALIGNANT CELLS SEEN	124/07	NO EVIDENCE OF MALIGNANCY	2
74	PALAYAM	48/F	451/07	CA CERVIX	iii B POST RT	-	1	94/07	SCC LARGE CELL TYPE	153/07	DYSPLASTIC SQUAMOUS CELLS	2
75	RADHAMAL	55/F	867230	CA ALVELOUS	T4AN1MX	+	2	109/07	NECROTIC DEBRIS	233/07	INFL KER SCC	1
76	SARASWATI	65/F	924/07	CA CHEEK LT	T4AN1M0	-	2	116/07	BENGIN SQUAMOUS CELLS	254/07	INFL KER SCC	1

77	PALANI	60/M	872748	CA UPP ALVEOLUS	T3N0M0	-	1	375/07	SCC NON KER	297/07	INF SCC	1
78	MOORTY	45/M	871329	CA TONGUE	T2N1M0	-	1	300/07	SCC LARGE CELL KER	331/07	INF KER SCC	1
79	SUDALAIMADAN	65/M	871689	CA RT BUCCAL MUCOSA	T3N1M0	+	2	283/07	BENGIN SQUAMOUS CELLS	345/07	INF KER SCC LARGE CELL TYPE	1
80	MEENA	30/F	1522/06	CA CERVIX	iii B POST RT	-	1	397/07	POSITIVE FOR MALIGNANT CELLS	351/07	INF KER SCC	1
81	MANIMEGALAI	44/F	1006/07	CA CERVIX		-	1	411/07	WELL DIFFERENTIATED SCC	361/07	WELL DIFF SCC	1
82	KAMALA	40/m	1049/07	CA CHEEK	T4AN1MX	+	2	414/07	NEGATIVE FOR MALIGNANCY	363/07	INF SCC	1
83	ANNAKILI	70/F	874352	CA CHEEK	T2NOMO	-	1	445/07	SQUAMOUS CELL CARCINOMA	369/07	INF SCC	1
84	RANGASAMY	50/M	875080	MELANOMA SOLE		-	1	446/07	POSITIVE FOR MELANOMA	374/07	MELANOMA	
85	DAMODRAN	33/M	875/60	CA TONGUE	T3N1MO	-	1	445/07	POSITIVE FOR MALIGNANT CELLS	376/07	INF SCC	1
86	SADASIVAM	60/M	874817	CHEEK POST RT	T2N1M0	+	2	448/07	MALIGNANT CELLS NOT SEEN	380/07	INF SCC	1
87	KAMAL	40/M	874298	CA CHEEK	T3N2M0	+	2	449/07	INFLAMMATORY CELL	381/07	INF SCC	1
88	RAJAMBAL	65/F	875559	CA CERVIX	iiiB	-	1	479/07	NON KERATINIZING SCC	431/07	NO EVIDENCE OF MALINGNANCY	2
89	BALAJI	32/M	875872	CA TONGUE	T2N2M0	-	1	455/07	POSITIVE FOR LARGE CELL KER SCC	453/07	INF SCC	1

90	LAKSHMI	60/F	875773	CA CHEEK POST RT	YRT4ANOMO	-	2	496/07	MALIGNANT CELLS NOT SEEN	467/07	INF SCC	1
91	MARIAMMAL	50/F	876088	CA CHEEK	T2N0M0	-	1	497/07	WELL DIFFERENTIATED SCC	471/07	INF SCC	1
92	MANI	40/M	1189/07	CA TONGUE	T4N0M0	-	1	518/07	LARGE CELL KERATINIZING SCC	483/07	INF SCC	1
93	PALANI	60/M	872748	CA UPP ALVEOLUS	T2M0N0	-	1	375/07	SCC KER	491/07	INF NON KER SCC	1
94	GIRI	55/M	877369	CA TONGUE	T1N0M0	-	1	547/07	SCC MOD DIFF	494/07	INF MOD DIFF SCC	1
95	KANNAN	54/M	877360	CA PENIS	T1N0M0	-	1	548/07	WELL DIFFERENTIATED SCC	497/07	INF SCC	1
96	ARUL MARY	35/F	36107	CERVICAL POLYP		+	2	569/07	INFL SMEAR	505/07	No EVIDENCE OF MALIGANCY	2
97	RATHINAM	67/M	1529/07	CA PENIS	T2N0M0	-	1	584/07	WELL DIFFERENTIATED SCC	512/07	SCC WELL DIFF	1
98	RAJARAM	61/M	1538/07	CA CHEEK	T3N2M0	-	1	592/07	SCC	532/07	INF SCC	1
99	CHELLAMMAL	53/F	879254	CA CERVIX POST RT	YRT2NOMO	-	1	597/07	POSITIVE FOR MALIGNANT CELLS	546/07	INF SCC	1
100	TANGAMMAL	63/F	164105	CA CHEEK POST RT/POST OP	YRT2N0M0	-		595/07	SCC	578/07	INF SCC	1
101	MURUGAN	56/M	879244	CA LT UPP ALVEOLUS POST RT		-	1	600/07	SCC LARGE CELL	589/07	INF SCC	1
102	RAJA	40/M	879588	CA RT BUCCAL MUCOSA	T2M0N0	-	1	601/07	SCC WELL DIFF	593/07	WELL DIFF SCC	1
103	RASHED	42/M	877177	SKIN ADNEXAL TUMOUR INFECTION		+	2	602/07	NECROTIC DEBRIS	613/07	MERKEL CELL CA	1

104	RAMACHANDRAN	58/M	878898	BCC NOSE		+	2	607/07	SQUAMOUS BASALOID CELL	634/07	BCC	1
105	MOHEMED GANI	55#M	878914	BCC NOSE		-	1	604/07	COMPATIBIE WITH SQUAMOUS CELL CARCINOMA	646/07	BCC	1
106	SHANTHI	35/F	878748	CA CERVIX IB		-	1	607/07	POSITIVE FOR LARGE CELL KER SCC	671/07	SCC LARGE CELLS	1
107	DANALAKSHMI	60/F	7573	CA CERVIX	iiiB	-	1	608/O7	POSITIVE FOR MALIGNANT CELLS	683/07	INF SCC	1
108	MARIAMMAL	55/F	879497	? CA CERVIX		-	2	632/07	SUSPECIOUS OF MALIGNANT CELLS	691/07	CH CERVICITIS	2
109	PERUMAL	50/M	1696/07	CA LOWER ALVEOLUS	T49N1M0	-	1	681/07	SCC LARGE CELL TYPE	721/07	WELL DIFF SCC	1
110	KOUSALYA	58/F	1268/07	CA CHEEK	T4N2M0	-	1	680/07	SCC LARGE CELL TYPE	745/07	SCC	1
111	RAJAMMAL	70/F	1743	CA CHEEK	T3N1M0	-		712/07	SCC	1138/07	INF SCC	1
112	ANNATHAI	50/F	881703	MELANOMA ANAL CANAL		-	1	713/07	COMPATIBLE WITH MELANOMA	1139/07	COMP WITH MALANOMA	1
113	TANGASAMY	51/M	882193	CA HARD PALATE		-		737/07	SCC	1145/07	INF SCC	1
114	AMUDHA	37/F	882335	CACX	Ib2	-	1	739/07	SCC NON KER	1156/07	INF NON KER SCC	1
115	DHIVASIVAM	60#M	882320	REC CA CHEEK		-		740/07	SCC	1167/07	NON SPECIFIC GRANULATION	2
116	RAMALINGAM	55/M	882187	CA CERVIX POST RT		-	1	741/07	SCC WELL DIFF	1171/07	INF SCC	1
117	ARAMMAL	65/F	1907/07	CA VULVA	T1N0M0	+	2	798/07	NEG FOR MALIGNANCY	1247/07	MA LIGNANT NOT SEEN	

118	MANOHARAN	40/M	883901`	CA TOUNGE	T4N1N0	-	1	824/07	WELL DIFFERENTIATED SCC	1251/07	SCC	1
119	DHAVASWAMY	52/M	883798	CA CHEEK	T3N25M0	-	1	825/07	WELL DIFFERENTIATED SCC	1256/07	SCC	1
120	KRISHNAMOORTHY	40/M	884277	CA UPPER LIP	T2N1M0	-	2	826/07	BENGIN SQUAMOUS CELLS	1269/07	SCC	1
121	ANNADURAI	56/M	883743	CA CHEEK	T2N0M0	-	1	827/07	SCC LARGE CELL TYPE	1271/07	INF SCC	1
122	BASKAR	29/M	883847	CA FOM POST RT		+	2	828/07	-VE FOR MALIGNANT CELLS	1281/07	MOD DIFFERENTIATED SCC	1
123	ALAGAMMAL	48/F	882884	CA CHEEK	T2 N0M0	+	2	829/07	-VE FOR MALIGNANT CELLS	1242/07	SCC VERRCUCCUS TYPE	1
124	SANKARA PANDIAN	38/M	883018	CA CHEEK POST RT/POST OP	T49N1M0	-	1	830/07	WELL DIFFERENTIATED SCC	1297/07	INF WELL DIFF SCC	1
125	PONNAMBALAM	74/M	2059/07	CA CHEEK	T3N1M0	-	1	856/07	SCC WELL DIFF	1321/07	INF SCC	1
126	MILTON	36/M	2084/07	CA TOUNGE	T1N0M0	-	2	864/07	DYSPLASIA	1334/07	INF SCC	1
127	NAGESH	55/M	2227/07	CA FOM		-	1	916/07	LARGE CELL SCC	1345/07	INF KERSCC	1
128	ANJALI	60/F	886557	CA CHEEK	T49N2M0	-	1	948/07	MALIGNANT SQUAMOUS CELLS	1356/07	INF KERSCC	1
129	RAYAPPAN	55/M	82320/07	CA CHEEK	T49N2M0	-	1	960/07	WELL DIFFERENTIATED SCC	1365/07	INF KER SCC	1
130	KOSALAI	35/F	887277	CA CX	I B	-	1	973/07	MALIGNANT SQUAMOUS CELLS	1370/07	INF KER SCC	1
131	NARAYANA RAO	49/M	887234	BCC RIGHT LEG	T2N0M0	-	1	1032/07	+VE FOR BCC	1371/07	BCC	1

132	KANNAPAN	52/M	887682	CA TOUNGE	T2N0M0	-	1	1033/07	SCC WELL DIFF	1383/07	INF KER SCC	1
133	RAMRAJ	54/M	886488	CA LIP	T1N0M0	-	2	1034/07	DYSPLASIA	1391/07	INF SCC	1
134	SUSILA	19/F	886469	REC MALIGNANT ULCER NECK		-	1	1035/07	MALIGNANT SQUAMOUS CELLS	1563/07	INF KER SCC	1
135	KOLANJIAMMAL	35/F	887816	CA CHEEK	T3N1	-	1	1039/07	SQUAMOUS CELL CARCINOMA	1560/07	INF KER SCC	1
136	DHAKSHANAMOOTHY	50/M	9038/07	CA CHEEK		-	1	1038/07	SCC KER	1559/07	INF KER SCC	1
137	LILLY	50/F	888154	CA UPP ALVEOLUS	T3N0M0	-	1	882/07	SCC WELL DIFF	1567/07	INF KER SCC	1
138	LATHIFA BEGUM	60/F	885149	CA CHEEK	T2N1M0	-		883/07	SCC	1570/07	WELL DIFF SCC	1
139	GOWRAMMAL	54/F	885075	CA VULVA	T3N1M0	-	1	884/07	AMELANOTIC MELANOMA	1571/07	AMELANOTIC MELANOMA	1
140	NAGAMMAL	60/F	2146/07	CA CHEEK	T4N1M0	-	1	891/07	SCC LARGE CELL KER	1578/07	INF KER SCC	1
141	KALHAYEE	60/F	885762	? CA CERVIX		-	1	912/07	+VE FOR MALIGNANT CELLS	1581/07	INF KER SCC	1
142	NAGESH	55/M	2227/07	CA FOM	YRT4AN0M0	-	1	916/07	LARGE CELL SCC	1587/07	INF KER SCC	1
143	MEENAKSHI	40/M	2232/07	CA CHEEK	T4N26	-	1	917/07	SCC KER	1594/07	WELL DIFF SCC	1
144	PERIYA SWAMY	35/M	886568	CA CHEEK	T49N2A	-	1	947/07	+VE FOR MALIGNANT CELLS	1621/07	INF KER SCC	1

145	PANCHALAM	55/F	25527	CA CX	II B	-	1	98/08	SCC LARGE CELLS KER	1634/07	INF SCC	1
146	KANNAN	67/M	855856	CA PALATE	T2N0M0	-	1	97/08	WELL DIFFERENTIATED SCC	1641/07	INF SCC	1
147	RAMALINGAM	58/M	212/08	CA LOWER ALVEOLUS	T2N26M0	-	1	113/08	SCC LARGE CELL TYPE	1654/07	INF SCC	1
148	VALLIAMAL	38/F	890640	CA CERVIX	II B	-	1	131/08	WELL DIFFERENTIATED SCC	1665/07	INF SCC	1
149	NEELA	50/F	890977	CA TOUNGE	T2N6M0	-	2	137/08	MALIGNANT CELLS NOT SEEN	1671/07	INF SCC	1
150	KUMAR	46/M	890708	CA CHEEK	T3N26M0	-	1	138/08	SCC NON KER	1678/07	INF KER SCC	1
151	THIYAGARAJ	45/M	890633	CA TOUNGE	T2N26	-	1	139/08	SCC LARGE CELL TYPE	1683/07	INF SCC	1
152	GOTHANAAYAGI	75/F	895567	CA TOUNGE	T2N0M0	-	1	156/08	SCC LARGE CELL TYPE	1691/07	INF SCC	1
153	RUKKUMANI	54/F	891347	CA VULVA	T2N2M0	-	1	175/08	SCC	1695/07	INF SCC	1
154	SEETHAVATHI	77/F	891670	MELANOMA RT FOOT		-	1	182/08	+VE FOR MALIGNANT MELANOMA	1699/07	MEL'MA	
155	SAJAN	34/M	836/08	CA SOFT PALATE	T4N3M0	-	1	196/08	WELL DIFFERENTIATED SCC	1711/07	INF SCC	1
156	THANGA KANI	50/F	892344	CA TOUNGE	T2N0M0	-	2	241/08	-VE FOR MALIGNANT CELLS	1734/07	INF SCC	1
157	JAYALAKSHMI	46/F	895589	CA CHEEK	T3N1	-	2	242/08	MALIGNANT CELLS NOT SEEN	1756/07	INF SCC	1
158	SELVAMANI	60/M	892764	CA CHEEK	T2N26	-	1	243/08	SCC LARGE CELL TYPE	1767/07	INF SCC	1
159	SADASIVAM	48/M	891128	CA UPP ALVEOLUS POST RT	YRT4AN0M0	+	2	244/08	NECROTIC DEBRIS	1789/07	INF SCC	1

160	DINAKARAN	58/M	911/04	CA TOUNGE	T2N0	-	1	312/08	SCC NON KER	1823/07	INF SCC	1
161	NAAGAMMAL	73/F	480/08	CA CX	II B	-	1	313/08	SCC NON KER	1867/07	INF SCC	1
162	RANGANATHAN	75/M	3684/08	CA LOWER LIP	T2N0	-	1	357/08	WELL DIFFERENTIATED SCC	462/08	INF SCC	1
163	SHANTHA	75/F	599/08	CA CHEEK	T3N0M0	+	2	359/08	-VE FOR MALIGNANT CELLS	461/08	INF SCC	1
164	SHANTHI	60/F	844667	CA CHEEK	T3N0M0	-	1	371/08	NON KERATINIZING SCC	463/08	INF KER SCC	1
165	SIVAGAMI	72/F	894266	CA VULVA POST RT	YRT2NOMO	-		400/08	+VE FOR SCC	469/08	INF SCC	1
166	RAMAPPA	52/M	894943	CA BUCCAL MUCOSA	T2N0M0	-	1	401/08	SCC WELL DIFF	472/08	INF KER SCC	1
167	CHANDRAN	54/M	893570	CA TOUNGE	T2N1MO	-	1	402/08	SCC LARGE CELL	501/08	INF KER SCC	1
168	KRISHNAMOORTHY	40/M	895174	CA LIP	T2N0M0	-	1	404/08	SCC LARGE CELL	489/08	SCC VERRCUCCUS TYPE	
169	NEELAMMAL	35/F	894392	CA CHEEK	T2N0M0	-	1	405/08	SCC LARGE CELL	455/08	INF SCC	1
170	KANNAN	65/M	774/09	CA CHEEK	T2N0M0	-	1	410/08	SCC NON KER	451/08	INF SCC	1
171	CHANDRA	40/F	894930	CA CX	II B	-	1	411/08	SCC KER	473/08	INF NON KER SCC	1
172	VELLADURAI	30/M	895128	REC SCC LEFT INGUINAL REGION	T4AN1MO	-	1	431/08	SCC	511/08	INF KER SCC	1
173	DHAMODARAN	50/M	583/08	CA CHEEK	T3N2M0	-	1	433/08	NON KERATINIZING SCC	521/08	INF NON KER SCC	1
174	CHELLAMMAL	60/F	895348	CERVICAL CARCINOMA 1B2	IB2	-	1	486/08	SQUAMOUS CELL CARCINOMA	534/08	Infilterating Squamous Cell Carcinoma	1

175	CHINNA SWAMY	52/M	896754	CA CHEEK	T3N2M0	+	2	491/08	-VE FOR MALIGNANT CELLS	546/08	INF KER SCC	1
176	NEELA	45/F	896221	CA CX VAULT		-		489/08	+VE FOR SCC	573/08	INF SCC	1
177	BASKAR	47/M	895789	CA SCROTUM	T2N0	-	2	474/08	-VE FOR MALIGNANT CELLS	574/08	SCC INF KER	1
178	ANJALI	65/F	897757	CA ENDO CERVIX		-		573/08	PAPILLARY CA	573/08	INF SCC	1
179	RAMADASS	40/M	1156/08	CA CHEEK	T4AN2	+	2	574/08	NEGATIVE FOR MALIGNANCY	574/08	INF SCC	1
180	JAYARAMAN	55/M	903141	CA TOUNGE	T49N2	-	1	873/08	SCC LARGE CELL TYPE	579/08	SCC	1
181	EZHILAPPAN	47/M	903568	BCC FACE	T2N1MO	-	2	74/08	BENGIN SQUAMOUS CELLS	581/08	BCC	1
182	VANAJA	42/F	902550	CA CHEEK POST RT	YRT4ANOMO	-	1	875/08	SCC KER TYPE	587/08	SCC	1
183	NAGARAJAN	46/M	1706/08	CA CHEEK	T3N0M0	-	1	891/08	+VE FOR MALIGNANT CELLS	589/08	SCC	1
184	SHANTHI	35/F	904675	CA CX	II B	-	2	952/08	META PLASTIC SQUAMOUS CELL	591/08	SCC	1
185	PERUMAL	70/M	904061	SCC CHEST WALL	T3N0	-	2	960/08	BENGIN SQUAMOUS CELLS	597/08	SCC	1
186	RAJA	47/M	903633	CA PENIS	T2N0	-	1	961/08	SCC	611/08	INF SCC	1
187	KUPPAMMAL	76/F	904568	CA CHEEK	T3N0M0	-	1	963/08	SCC	621/08	INF SCC	1
188	SANTHA MARY	53/F	905726	CA CHEEK	T4N0M0	+	2	987/08	-VE FOR SCC	635/08	SCC	1
189	ALAMELU	75/F	1468/08	CA CHEEK	T49N2M0	-	2	988/08	BENGIN SQUAMOUS CELLS	643/08	SCC	1

190	THANGAMANI	55/F	905666	CA CHEEK	T2N0M0	-	1	989/08	SCC KER TYPE	656/08	INF SCC	1
191	TAMILARASAN	40/M	1022/08	CA TOUNGE	T49N2M0	-	1	1022/08	+VE FOR SCC	663/08	INF SCC	1
192	MARY	37/F	906267	CA CX	II B	-	1	1044/08	+VE FOR SCC	671/08	INF SCC	1
193	CHINNA KULANTHAI	56/F	906092	CA CX	II B	-	1	1045/08	+VE FOR SCC	675/08	INF SCC	1
194	kannan	45/M	906272	CA cheek	T2N0M0	-	2	1055/08	+VE FOR SCC	677/08	INF SCC	1
195	munuswamy	65/M	907176	CA tounge	T4AN1M0	-	2	1060/08	+VE FOR SCC	679/09	INF SCC	1
196	sekar	30/M	908140	CA tounge	T2N0M0	-	2	1062/08	+VE FOR SCC	680/09	INF SCC	1
197	mariammal	55/F	62/09	CA alveolus	T4AN0M0	-	2	70/09	SCC KER TYPE	65/09	INF SCC	1
198	selvarani	60/F	90/09	CA cheek	T3N1	-	2	102/09	SCC KER	90/09	INF SCC	1
199	fathima	45/F	122/09	CA CX	I B	-	2	115/09	+VE FOR SCC	102/09	INF SCC	1
200	gayathri	42/F	290/09	CACX	II B	-	2	310/09	+VE FOR SCC	288/09	INF SCC	1
201	THILAGAVATHI	38/F	2076/08	CA CX	I B	-	2	1046/08	-VE FOR SCC	681/08	NO EVID FOR MALIGNANCY	2
202	KALAVATHI	53/F	907174	CA CX	I B	-	2	1059/08	DYSPLASIA	684/08	INF KER	1
203	DHANALAKSHMI	42/F	907936	CA CHEEK POST RT	T49N0M0	-	1	1110/08	SCC GRADE 1	689/08	INF SCC	1
204	DHANALAKSHMI	70/F	908144	SCC NOSE	T3N2	-	1	1109/08	SCC GRADE 2	691/08	INF SCC	1
205	SELVAM	42/M	907936	CA CHEEK POST RT	T49M0N0	-	1	1110/08	SCC GRADE 1	694/0	INF SCC	1
206	ANNALAKSHMI	55/F	908876	MELANOMA OVER STERNUM		-	1	1111/08	+VE FOR MALIGNANT	703/08	MELANOMA	1
207	RAMASAMY	56/M	908881	CA TOUGE	T2MONO	-	1	1115/08	+VE FOR SCC	717/08	INFLT SCC	1